UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,686	07/24/2003	T. Richard Jow	ARL 02-27	9428

37064 7590 03/27/2006

OFFICE OF COMMAND COUNSEL,
U.S. ARMY MATERIEL COMMAND
ATTN: AMCCC-B-IP
9301 CHAPEK ROAD
FORT BELVOIR, VA 22060-5527

EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/625,686	JOW ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *5,9-12 and 14-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/24/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. The election with traverse of claims 1-4, 6-8 and 13 is acknowledged.

2. Claims 5, 9-12 and 14-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions. Applicant timely traversed the restriction (election) requirement in the reply filed on January 20, 2006.

3. Applicant's election with traverse in the reply filed on January 20, 2006 is acknowledged. The traversal is on the ground(s) that the search is not burdensome. This is not found persuasive for the reasons set forth in the previous office action.

Contrary to Applicant's arguments, the examiner maintains that the search for each of groups I, II and III are divergent and burdensome and therefore properly restrictable. Furthermore, Applicants argument to the restriction of the product of claim 21 lacks any substantive reasons for rejoining this composition whose search would be an obvious burdensome search relative to the electrolyte of Group I and battery and method of enhancing a battery of Group II.

The requirement is still deemed proper and is therefore made FINAL.

4. With respect to the election of species requirement to the electrolyte salt, this requirement has been withdrawn since Applicant has clearly admitted on the record that:

> "Applicant, however, respectfully traverses the requirement to Elect one alkali metal salt since the use of any of these salts as listed in Claim 6 would be an obvious variant one over the other."

Thus Applicant has met the requirement presented on page 5, lines 1-6 of the previous office action by admitting that the electrolyte salts are obvious variants.

Priority

5. Applicant's claim to U.S. Provisional Application No. 60/398,712, filed July 29, 2002 is acknowledged.

Information Disclosure Statement

6. The information disclosure statement filed July 24, 2003 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

7. The drawings received July 24, 2003 are acceptable for examination purposes.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-8 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While Applicant has elected particular species, the exact scope of the claimed invention is unclear. For example, considering the genus of claims 1 and 4, it is unclear whether or not the electrolyte and additive salt must be different or not since at least some of the electrolyte salts disclosed and recited in claim 4, for example, are also exemplary of the additive salt (for example $LiB(C_2O_4)$ and $LiBF_2C_2O_4$). Thus if the two

salts can be the same then there would not be any salt mixture but rather a single salt. It may then be that the composition of electrolyte salt, in order to constitute a mixture with the additive salt, would need to be a different composition.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1-4, 6-8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,783,896 (Tsujioka) in view of U.S. Patent No. 6,506,516 (Wietelmann).

Tsujioka discloses an electrolyte comprising a non-aqueous solvent and a salt mixture comprising an alkali metal electrolyte salt and an additive salt having an anion of a mixed anhydride of oxalic acid and boric acid (see Example 2-2 as applied to claim 1).

The additive salt is 0.1 mol of the lithium borate derivative to the total salt mixture (Example 2 and col. 7, ll. 47-60 as applied to claim 2).

The additive salt is Lib$BF_2C_2O_4$ (Examples 2-1 and 2-2 as applied to claim 3).

The electrolyte metal salt is LiPF6 (as applied to claims 4 and 6). With respect to the election of species requirement to the electrolyte salt, this requirement has been withdrawn since Applicant has clearly admitted on the record that:

> "Applicant, however, respectfully traverses the requirement to Elect one alkali metal salt since the use of any of these salts as listed in Claim 6 would be an obvious variant one over the other."

Thus Applicant has met the requirement presented on page 5, lines 1-6 of the previous office action by admitting that the electrolyte salts are obvious variants.

The non-aqueous solvent includes carbonic esters such as PC and DEC (Example 2-2 as applied to claims 7 and 8).

The total salt mixture is present in an amount of 1 mol/L (see example 2-2 as applied to claim 13).

Tsujioka does not explicitly disclose the elected combination of $LiB(C_2O_4)$ and $LiBF_2C_2O_4$ additive salt mixture and PE-EC-EMC solvent mixture.

With respect to elected combination of $LiB(C_2O_4)$ and $LiBF_2C_2O_4$ additive salt mixture:

As discussed above, Tsujioka teaches that $LiBF_2C_2O_4$ is a known additive salt used in an electrolyte salt mixture.

$LiB(C_2O_4)$, or LiBOB is also a recognized electrolyte salt additive as taught by Wietelmann (abstract).

There is no apparent criticality to the use of both $LiB(C_2O_4)$ and $LiBF_2C_2O_4$ additive salt mixture as compared to each of these alone. Thus since each one is a recognized electrolyte salt additive,

It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. The idea of combining them flows logically from their having been individually taught in the prior art. In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960) and Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992). MPEP § 2144.06.

Therefore in the absence of any criticality of the elected mixture compared to either of the separate additive salt materials themselves and since each individual salt additive is used for the same purpose, it is established that providing a mixture of the two combination would have been readily apparent to one of ordinary skill in the art, absent clear evidence to the contrary.

With respect to PE-EC-EMC solvent mixture.

The use of various carbonic esters including propylene carbonate (PC), ethylene carbonate (EC), ethylmethyl carbonate (EMC), etc. are well known non-aqueous solvents used in fabrication of lithium electrolyte salts.

Tsujioka also recognized the same broader species as taught in the instant application which includes a solvent either alone or a mixture of two or more types including PC, EC and ethylmethyl carbonate (col. 8, ll. 10-17). The selection of any of the combination of solvent materials would have been within the skill of the ordinary worker in the art for the purposes of providing a solvent in which the salts can be incorporated.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 1-4, 6-8 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsujioka.

While applicant has elected an ultimate species, as addressed in the rejection above, the following rejection is made with respect to the broader claimed invention of the elected claims 1-4, 6-8 and 13.

Tsujioka discloses an electrolyte comprising a non-aqueous solvent and a salt mixture comprising an alkali metal electrolyte salt and an additive salt having an anion of a mixed anhydride of oxalic acid and boric acid (see Example 2-2 as applied to claim 1).

The additive salt is 0.1 mol of the lithium borate derivative to the total salt mixture (Example 2 and col. 7, ll. 47-60 as applied to claim 2).

The additive salt is $LibBF_2C_2O_4$ (Examples 2-1 and 2-2 as applied to claim 3). The electrolyte metal salt is LiPF6 (as applied to claims 4 and 6).

The non-aqueous solvent includes carbonic esters such as PC and DEC (Example 2-2 as applied to claims 7 and 8).

The total salt mixture is present in an amount of 1 mol/L (see example 2-2 as applied to claim 13).

Thus it appears that Tsujioka anticipates the broader invention of claims 1-4, 6-8 and 13.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc

March 23, 2006